# Medical Education

## Educating Internists in Emergency Medicine

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*The education of internists in emergency medicine needs to be thoughtfully planned by those involved in their education. Objectives for their emergency medicine rotation include the recognition and initial treatment of true medical and surgical emergencies, clinical experience with and knowledge of common acute primary care problems, the ability to handle several patients with problems having different degrees of urgency, effective use of consultants in the follow-up and management of difficult patients and a knowledge of and clinical experience with the prehospital care system. A curriculum should be designed to give the resident a core of didactic material in addition to supervised clinical experience. The rotation should be evaluated by both residents and faculty from internal medicine and emergency medicine to determine if it is accomplishing the objectives set forth.*

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Educating internal medicine residents in emergency medicine has typically been confined to clinical experience in hospital emergency departments during one- to three-month rotations. No clearly recognized objectives, curriculum or core body of knowledge and skills has been described. An objective assessment of competence in emergency medicine does not exist as it does in other areas of internal medicine. This state of confusion often leaves residents uncertain about what they should learn from their emergency medicine rotation. Moreover, program directors are often not sure how to evaluate the emergency medicine experience.

Over the past decade emergency medicine has emerged as the 23rd specialty with its own residency training programs, core curriculum and certification examination. Those involved in emergency medicine education have concentrated their efforts on emergency medicine residency training, defining a curriculum and certifying competency for physicians practicing emergency medicine as their specialty.[1-3] Some effort has been made to define objectives and outline a curriculum in emergency medicine for medical students[4]; however, very little attention has been given to residents training in internal medicine, surgery or family practice who spend several months in the emergency department.

The development of emergency medicine as a specialty, the definition of its core knowledge and skills and the creation of training programs with dedicated educators in emergency medicine should all be regarded as positive steps for internists. Much of the knowledge and skills overlaps with that in internal medicine, and the emergency medicine rotation provides an opportunity to develop expertise in a unique clinical setting unmatched by the medical wards, clinics or subspecialty consultation services.

### Objectives

The first step in approaching this problem is to design realistic objectives for internists in emergency medicine. What should an internist know about emergency medicine? We propose the following objectives:

- *Recognition and initial treatment of true medical and surgical emergencies.* Internists need to be aware of true emergencies even if they are not the ones who will primarily care for the patients. They also must be capable of initial resuscitation and stabilization efforts. For example, a patient presenting with a clinical picture consistent with a central retinal artery occlusion must be treated immediately even though an ophthalmologist will institute more definitive care. Initial management of a patient with, say, a dissecting aortic aneurysm or intestinal obstruction, clearly lies in the realm of the internists.

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• *Clinical experience with and knowledge of common acute "non-internal medicine" primary care problems.* Many of these acute problems will present in an office or clinic practice and the emergency department exposure is the only opportunity that an internal medicine resident will have to approach these problems. These might include animal and arthropod bites and stings, simple lacerations, corneal abrasions, ankle sprains and the like.

• *The ability to treat several patients with problems of different degrees of acuteness.* While the emphasis in internal medicine training is on thoroughness and comprehensive care, the emphasis in the emergency department is on the presenting problem and its relative urgency. Often residents are asked to manage several patients at once and to make decisions regarding triage priorities.

• *Effective use of consultants in follow-up and management of difficult patients.* Emergency physicians, like internists, will often refer specific problems to outside consultants. Training in what types of cases primary care practitioners can follow and which should be referred, and the urgency of referral, is a skill that must be learned. For example, it is appropriate for a primary care practitioner to follow most cases of ankle sprain after conservative treatment; however, a patient presenting with pain in the "snuffbox" of the wrist after a fall and with no radiographic fracture needs the wrist immobilized and then to be referred to an orthopedist for a possible navicular fracture.

• *Knowledge of and clinical experience with the prehospital care system.* Over the past decade prehospital care has become an important part of our medical care system. Internists should be familiar with the training and function of paramedics and emergency medical technicians (EMT) and of concepts of trauma centers, triage and disaster planning.

## Curriculum

The structure of the emergency medicine rotation will vary depending on the service needs of an emergency department and its basic staffing pattern. Nevertheless, certain similarities will exist. The experience should consist of a planned combination of didactic material and clinical experience. The on-line clinical duty in which a resident evaluates and treats patients in the emergency department should consist of 40 to 60 hours per week. Less than 40 hours will give residents too little clinical exposure for the variety of problems with which they must have experience. Clinical time of more than 60 hours per week tends to make a rotation purely a "service" experience and gives residents little time or incentive to study the essential didactic material. The clinical experience must be directly supervised by attending physicians capable of and interested in teaching residents about emergency medicine. The exact mechanism for this supervision will vary from program to program but this mechanism must be clear to the residents, allowing a means of educational feedback regarding the clinical problems they are encountering. The optimal method will be to use full-time emergency medicine faculty to review each patient and be available for immediate consultation. A program of unsupervised residents in an emergency department relying on a resident consultant for their education and assistance with patient care is inadequate to accomplish the goals enumerated above and may lead to poor patient care. Also, dividing an emergency department into subspecialty sections and having medical residents see only medical problems and surgical residents only surgical problems will not accomplish the goals described.

Didactic material should consist of lectures, handout material, pertinent journal articles and book chapters. This material should be given or made available to residents at the beginning of their rotation. It should be of a length that residents can realistically master during their rotation. It must be made clear at the beginning of the rotation that this material is the core of didactic material that they are expected to learn during their emergency medicine rotation. Pursuing one topic in greater depth should, of course, be encouraged depending on the goals and interests of individual residents. Handing a resident a two-volume textbook of emergency medicine and expecting that person to master the knowledge therein in a one-month rotation is impractical.

The exact nature of the core material presented to residents must be determined by the residency directors and the educators in charge of their emergency medicine rotations. Determination of content should be based on departmental priorities, faculty and laboratory resources, the year of postgraduate training and total time spent in the emergency department. In this paper we propose areas of core content that should be considered and given suitable priority when making the decisions regarding an individual rotation.

• *Cardiac life support.* The material presented in the textbook of advanced cardiac life support by the American Heart Association should be a part of the knowledge base of all medical residents. This may be provided as a separate advanced cardiac life support course at the beginning of their residency or in various lectures in their cardiology training. If it is not formally provided elsewhere, the algorithms for managing cardiac arrest and the pharmacology of advanced cardiac life support drugs, together with new developments in controversies in the area of cardiopulmonary resuscitation, should be presented in the form of lectures, handouts or simulated megacode testing stations.

• *Advanced trauma life support.* The Committee on Trauma of the American College of Surgeons has developed an advanced trauma life support course designed to teach primary care physicians advanced lifesaving techniques and stabilization procedures necessary within the first hour of trauma management. Again, this can be given either as a two- to three-day course at the beginning of the residency or if it is not

available as a separate course, the didactic material might be presented in the form of lectures, handouts and so forth, including lectures on priorities in cases of multiple trauma, airway management and shock and thoracic, abdominal, head, cervical spine and extremity trauma. Other elements of this course include an emergency procedures animal laboratory. This laboratory gives residents an opportunity to learn and practice cutdowns, central venous line placement, chest tube placement, peritoneal lavage and cricothyroidotomy. Other practical aspects include the use of the pneumatic antishock garment and cervical spine immobilization.

- *Emergency medical services.* Residents should be given an orientation to the emergency care system in their community. They should be aware of the training and capability of paramedics and EMTs. If possible, an evening spent riding with paramedics would be an excellent experience in prehospital care medicine. The role of communications, hospital cooperation, categorization and designation of specialty centers (trauma centers, burn centers and so forth), disaster planning and triage as part of emergency medical services planning should all be reviewed.

- *Toxicology.* The diagnosis and management of overdoses should be taught with specific emphasis on common drugs and those with antidotes.

- *Environmental injuries.* Material should be presented to residents on the appropriate management of bites and stings (including arthropods, snakes and dogs). Knowledge of other environmental injuries such as hyperthermia, hypothermia, burns, electrical injuries, drowning and trauma should all be reviewed.

- *Common orthopedic injuries.* This material should emphasize treatment of common strains and sprains, dislocations and when a primary care physician can follow a patient or when the case should be referred to a specialist.

- *Obstetric-gynecologic emergencies.* Residents should have knowledge of the workup and management of cases of ectopic pregnancy, pelvic inflammatory disease, acute vaginal bleeding, spontaneous abortion and the dangers of third trimester bleeding.

- *Ophthalmologic emergencies.* Residents should be aware of the clinical presentation and treatment of ophthalmologic emergencies (central retinal artery occlusion, chemical burns) and other problems such as corneal abrasions, conjunctivitis, foreign bodies, iritis and acute glaucoma.

- *Ear, nose and throat disorders.* Residents should feel comfortable managing common ear, nose and throat infections and epistaxis.

- *Neurological problems.* Diseases such as stroke, headaches, central nervous system infections and seizures should be discussed and their management reviewed.

- *Psychiatry.* Residents should be able to deal with suicidal patients, cases of acute psychosis and acute grief reactions and hostile disruptive patients and make an attempt to differentiate organic problems from functional ones.

- *Pediatric emergencies.* Material on child abuse, diarrhea, vomiting, dehydration, meningitis, croup, epiglottiditis, bronchiolitis and asthma should all be presented to residents.

- *Laceration repair.* Handouts, lectures or workshops should be given on suture material, wound infections, wound healing and methods of repairing complicated lacerations.

- *Acute allergic reactions.* Residents should be advised on the management of anaphylaxis and other allergic reactions including asthma.

## Evaluation

Both residents and the rotation need to be periodically evaluated as to whether the program is accomplishing the objectives stated. This can be accomplished through objective written pretests and posttests of residents' knowledge of the didactic material and subjective evaluation by both resident and faculty. Evaluation of skills can be accomplished through the use of simulated trauma patients, megacode simulations and records of ability to carry out specific tasks such as chest-tube insertions, central lines or placement of military antishock trousers.

## Implementation

An example of one system in which this curriculum has been implemented is the emergency medicine rotation for internal medicine residents at the University of Arizona Health Sciences Center. On the first day of rotation, residents are given an orientation to the Emergency Medical System in Tucson and objectives of the rotation are reviewed. They also go through a dog laboratory in which procedures in emergency medicine are taught, such as venous cutdowns, central venous line placement, diagnostic peritoneal lavage, chest tube insertion and cricothyroidotomy. Then, throughout the month core lectures are given by the faculty covering the basic curriculum in emergency medicine. These monthly lectures include the following topics: Toxicologic Emergencies, Ophthalmologic Emergencies, Pediatric Emergencies, New Developments in Advanced Cardiac Life Support, Chest Trauma, Head and Facial Trauma, Abdominal Trauma, Hand Injuries, Dislocations, Psychiatric Emergencies and Environmental Injuries. These lectures occur near "change of shift" in the morning, so that both the resident getting off duty and the one going on duty may attend. Faculty or senior emergency medicine residents cover clinical duties in the emergency department during these lectures. At orientation the resident also receives a 120-page booklet that reviews and outlines the important points of the 11 core lectures given. It is emphasized that this material is the core knowledge base that we expect the resident to learn during the emergency medi-

cine rotation. Evaluating the rotation is accomplished through subjective evaluation by residents of specific aspects of the rotation and of faculty's teaching ability. Each resident's clinical skills are also subjectively evaluated by all the faculty with whom the resident has worked.

Objective multiple-choice pretests and posttests were given when the system was first implemented. The tests were divided and graded in subsections based on the core lecture material. This gave the instructors a tool to gauge the baseline knowledge of the residents and the effectiveness of their lectures. This is one example of how a core curriculum can be implemented to meet the stated objectives in a one-month rotation. It is practical but requires faculty who are interested in and dedicated to providing a valuable experience in emergency medicine for internal medicine residents.

**REFERENCES**

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